

ELECTRICAL TRAINING

myElectrical Engineering provides electrical consulting services for a comprehensive range of issues and problems and has developed, myCableEngineering.com, web-based cable management and sizing application. Utilising our expertise, we are able to offer on-site training covering a wide variety of electrical topics

Our training sessions are presented by Steven McFadyen. As a chartered electrical expert with over thirty years of experience on large technically challenging projects, including petrochemical, mining, airports and buildings. Steven has an exceptional aptitude for electrical engineering and is the perfect person for this role.

We can develop customised training sessions to suit your needs, in either a workshop or presentation style session. Combining this with Steven's expertise and his ability to communicate and interact with attendees, will ensure that each and every session provides exceptional value and benefit to your employees.

HOW THE SESSIONS WORK

Our training is session based, with each session lasting approximately three hours. We can provide single sessions or two sessions in one day. While we can present at almost any time, our preferred training schedule is:

- 9:00am - 12:00pm - session 1
- 13:00pm - 16:00pm - session

Our sessions are structured with a fixed agenda. The cost and content delivery depend on the number of attendees.

Small Group: up to 5 attendees maximum. Sessions are run in the form of a workshop, based on the proposed agenda. Attendee questions and discussion are encouraged throughout the training session. Given the free-flow nature of these sessions, it may not be possible to complete the proposed agenda in the allocated time.

Medium Group: up to 12 attendees maximum. These sessions will follow the agenda more strictly and be in a presentation form. Time for questions will be allocated at key points during the presentation.

Large Group: above 12 attendees. These sessions will follow the agenda more strictly and be in a presentation form. Approximately 30 minutes for questions will be allocated at the end of the presentation.

TRAINING SESSION CONTENT TOPICS

Our training sessions are intended for electrical contractors, electrical engineers, and users with a basic understanding of electrical engineering. Our courses are further categorised by level:

- Level 1 [L1] - introductory and suitable for all attendees
- Level 2 [L2] - intermediate, and suitable for attendees with some basic understanding
- Level 3 [L3] - advanced, building on a firm underlying foundation

PRE-CONFIGURED TRAINING

We have put together suggestions for some short sessions based on our more frequently requested training. These sessions can be used as is, or modules substituted or added from our pick and match section.

PICK AND MATCH

Build a custom training course by choosing topics from of list of available modules.

Prerequisites are suggested to be taken as part of the session makeup. These will help in understanding subsequent modules. Module times are approximate, round to the nearest 30 minutes and allow for questions.

Notes:

1. many of our topic use live web connections. If internet connectivity is not available, please inform us in advance so that we can make the necessary modifications.
2. small, medium groups will be given worked examples during the session to practice the principals taught. In large groups, examples will be worked through by the presenter.

PRE-CONFIGURED TRAINING

EBT900 Cable Sizing BS7671 - Level 1 [3 hours]

1. EBT002 Cable standards
2. EBT003 BS 7671 sustained current capacity [Level 2]
3. EBT009 Voltage Drop - BS 7671, CENELEC CLC/TR 50480
4. EBT010 Cable Fault Rating

EBT910 ETAP Introduction & Cable Sizing - Level 1 [3 hours 30 minutes]

1. EBT101 ETAP Introduction
2. EBT102 ETAP Basic Schematic Building
3. EBT103 ETAP Load Flow calculations
4. EBT104 ETAP Short circuit calculations
5. EBT105 ETAP Cable Sizing BS 7671, IEC 60364
6. EBT106 ETAP Underground thermal - IEC 60287, Neher-McGrath

EBT920 - Low Voltage Circuit Breakers - Level 1 [3 hours]

1. EBT201 Low Voltage Circuit Breakers - function, types
2. EBT202 Moulded Case Circuit Breakers [MCCB] - construction, types, standards, rating and specification
3. EBT203 Miniature Circuit Breakers [MCB] - construction, types, standards, rating and specification
4. EBT203 Introduction to the protection coordination of circuit breakers
5. EBT204 Introduction to harmonic effects of circuit breakers
6. EBT205 Maintenance of circuit breakers

PICK AND MATCH

COURSE TOPICS - CABLES

	Title	Duration Minutes	Prerequisites
EBT001 L1	Cable Construction	30	
EBT002 L1	Cable standards	30	EBT001
EBT003 L2	BS 7671 sustained current capacity	60	EBT002
EBT004 L2	IEC 60364 sustained current capacity	60	EBT002
EBT005 L2	ERA 69-30 sustained current capacity	60	EBT002
EBT006 L2	IEC 60502 Sustained current capacity	60	EBT002
EBT007 L2	IEC 60287 sustained current capacity	60	EBT002
EBT0071 L2	IEC 60287 - DC & AC resistance of conductors	60	EBT007
EBT0072 L2	IEC 60287 Dielectric loss	30	EBT007
EBT0073 L2	IEC 60287 Sheath, screen and armour loss	60	EBT007
EBT0074 L2	IEC 60287 Thermal resistance -, T1, T2 & T3	60	EBT007
EBT0075 L2	IEC 60287 Thermal resistance - T4	60	EBT007
EBT008 L2	Cyclic, transient heating	60	EBT002
EBT009 L2	Voltage Drop - BS 7671, CENELEC CLC/TR 50480	60	EBT002
EBT010 L2	Cable Fault Rating	30	EBT002

COURSE TOPICS - ELECTRICAL POWER

	Title	Duration Minutes	Prerequisites
EBT601 L1	Key electrical quantities - definitions	30	
EBT602 L1	Current, voltage, and resistance relations [ohms law]	30	EBT601
EBT603 L1	Power generation - direct current	30	EBT602
EBT604 L1	Power generation - alternating current	30	EBT602
EBT605 L1	Current, voltage, and impedance relations [single-phase]	60	EBT604
EBT606 L1	Complex Power	60	EBT605
EBT607 L1	Three phase power circuits	60	EBT605
EBT608 L1	Earth fault loop impedance	60	EBT605

COURSE TOPICS - ETAP

	Title	Duration Minutes	Prerequisites
EBT101 L1	ETAP Introduction	30	
EBT102 L1	ETAP Basic Schematic Building	30	EBT101
EBT103 L1	ETAP Load Flow calculations	30	EBT102
EBT104 L1	ETAP Short circuit calculations	30	EBT102
EBT105 L1	ETAP Cable Sizing BS 7671, IEC 60364	30	EBT102
EBT106 L2	ETAP Underground thermal - IEC 60287, Neher-McGrath	60	EBT102
EBT107 L2	ETAP - Protection coordination	120	EBT104

COURSE TOPICS - PROTECTIVE DEVICES

	Title	Duration Minutes	Prerequisites
EBT201 L1	Low Voltage Circuit Breakers - function, types	30	
EBT202 L1	Moulded Case Circuit Breakers [MCCB] - construction, types, standards, rating and specification	30	EBT201
EBT203 L1	Miniature Circuit Breakers [MCB] - construction, types, standards, rating and specification	30	EBT201
EBT203 L1	Introduction to the protection coordination of circuit breakers	30	EBT201
EBT204 L1	Introduction to harmonic effects on circuit breakers	30	EBT201
EBT205 L1	Maintenance of circuit breakers	30	EBT201

We are developing topics/sessions for the following:

- IEC 60287 - calculation of the current rating of cables - Level 2
- myCableEngineering.com - application training - Level 1
- Protection Coordination and Discrimination - Level 2
- Fault calculations - Level 2

Please, contact us for agendas on the above, or if you are interested in us developing a custom session on training on a topic not listed.

** we reserve the right to modify course content as we develop and improve our training courses.

** all course content remains the intellectual property of myElectrical Engineering.

COSTS

Costs depend on group size, training location and required number and duration of sessions. Please contact us for a quotation.

Our costs are transparent and typically include:

- A cost per session (dependant on the duration and the number of attendees)
- A cost for travel
- A cost for overnight accommodation if necessary**
- A cost for venue hire, if not at the client's location

** we allow a maximum daily workload of 10 hours (including 1-hour lunch and travel). For away from home exceeding this, overnight stay(s) are required.

ATTACHMENTS

CV - STEVEN MCFADYEN

MYELECTRICAL ENGINEERING - OVERVIEW

Chartered electrical expert with over thirty years experience and a focus on large technically challenging projects. International project experience covers petrochemical, power systems, airports, rail, infrastructure and buildings. Exceptional aptitude for electrical engineering and utilises this ability to ensure that all details are covered.

EXPERIENCE

myElectrical Engineering / Director | Electrical Consulting Services

United Kingdom, July 2014 to present

Founder of myElectrical Engineering, providing electrical consulting services for power distribution, renewable energy and other sectors. Development of a commercial web-based cable sizing application (myCableEngineering.com).

Qatar Petroleum (Special Division - ASTAD Project Management) / Lead Electrical Engineer

Qatar, July 2012 to June 2014

Discipline lead in charge of a team of fifteen electrical engineers. Qatar Foundation Education City (40 billion USD), infrastructure, buildings and rail system. Infrastructure master planning for two new economic free zones (5 and 25 million m²).

Arup Gulf Limited / Electrical Team Leader

United Arab Emirates, 2008 - 2012

Responsibility for the performance of electrical design teams, both local and remote for all UAE projects. Masdar Zero Carbon City, Aldar HQ building, Guggenheim Abu Dhabi , Dubai Airport expansion and infrastructure master planning for Madinat Zayed.

IDA International / Electrical Director

Hong Kong, 2005 - 2007

Responsible for design and delivery of data centres and mission critical facilities in SE Asia.

SKM - Sinclair Knight Merz / Senior Electrical Engineer

New Zealand, 2004 - 2005

Team leader for substation, power distribution and large water pumping projects. Design/construction of several 33/11 kV zone substations (capital cost NZD 3m each). Two fresh water pumping stations (capital cost NZD 40m) for North Otago Irrigation.

Hyder Consulting / KCRC, Hong Kong, (18 month contract) 2002 - 2004

Resident Engineer (E&M)

West Rail project, Nam Cheong (HKD3.1 billion) and Mei Foo (HKD1.2 billion) stations.

Leighton Contractors Asia / Design Manager

Hong Kong, (12 month contract) 2001 - 2002

Design and build Cargo Stand expansion for Hong Kong Airport (HKD 162 million) - 400Hz fixed ground power airfield ground lighting, control systems, high mast lighting and aviation fuel supply.

Airport Authority / Construction Engineer

Hong Kong (28 month contract) 1996 - 2000

Responsible for the design/construction of the airports two HKD225m seawater-pumping stations, providing cooling water for all Airport facilities on the 12.5 million m2 development.

Waste Management Group / Technical Manager

Hong Kong & China, 1994 - 1996

Hong Kong SENT landfill. China FDA approved pharmaceutical plants for Johnson & Johnson and Allergan and manufacturing plants for International Paper, Duracell and Amway.

Conalec / Watson Edwards & V.D.Spuy / Principal Electrical Engineer

South Africa, 1988 - 1993

Electrical design, Moss gas project (world's largest GTL). Township reticulation, precipitators, mobile switchgear, 660 MW generator protection, water demineralisation, hydrogen plant and ash stackers.

General Mining Union Corporation / Section Engineer

South Africa, 1985 - 1988

Section engineer under the Mines and Works Acts two shafts at Winkelhaak Gold Mine.

EDUCATION & AFFILIATIONS

- MSc Electrical Engineering, University of the Witwatersrand South Africa 1994
- GDE Electrical Engineering, University of the Witwatersrand South Africa 1992
- Government Certificate of Competency in Mining (South Africa) 1987
- BSc Electrical Engineering, University of Salford, United Kingdom 1985

- CEng MIET, Chartered Engineer, IET, United Kingdom 1992
- Eur Ing, European Engineer, FEANI 1994
- Pr Eng, Professional Engineer, ECSA, South Africa 1991 / Ir The SAIEE, South African, 1991
- LEED Accredited Professional, USGBC, United States 2004
- Breeam Certified Assessor, BRE, United Kingdom, 2009

PUBLICATIONS AND WEBSITES

- Estimating Power Demand in Buildings (2016)
- Motor Starting and Control Primer: An introduction to the starting techniques and control of electric motors (2014)
- Braking Formulae for Emergency Braking without Electrical Braking (1987)

myElectrical.com - – an online resource for expert knowledge sharing aimed at practising electrical engineers and electrical engineering students. Online since 2002.

myCableEngineering.com - online web-based application for management and sizing of power cables, inline with international standards such as BS 7671, IEC 60502 and IEC 60287.

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ELECTRICAL ENGINEERING SOLUTIONS & CONSULTING SERVICES

WE EXCEL AT TECHNICAL EXCELLENCE & PROVIDING SERVICES QUICKLY TO CATER FOR OUR CLIENTS REQUIREMENTS.



"We have used myElectrical Engineering on many generation projects and rely totally on them for technical advice. We have had brilliant service and support for all our projects, large or small, and would thoroughly recommend them."

Paul Van Reyk,
Fatris Limited



Introduction

myElectrical Engineering provides electrical consulting services tailored to the clients business needs. Using ETAP, EMTP-ATP and AMTECH we provide solutions to a comprehensive range of issues and problems.

Working with consultants, contractors and end users, we develop bespoke solutions that thoroughly address the clients needs. By cooperating closely with clients, we ensure solutions are not only technically adequate, but cost efficient and fully address all project requirements.

We offer expertise the client may not have, and by bringing new ideas, we not only provide solutions but often can do this with significant savings on installation and operating costs. Repeat business from our clients is a testimony to our success in this.

We are committed to delivering on our promises and have the knowledge, experience and commitment to achieve this.



We deliver
innovative
solutions

Services - what we offer

myElectrical Engineering provides help tailored to the clients business needs. Using ETAP, EMTP-ATP and AMTECH we provide solutions to a comprehensive range of issues and problems.

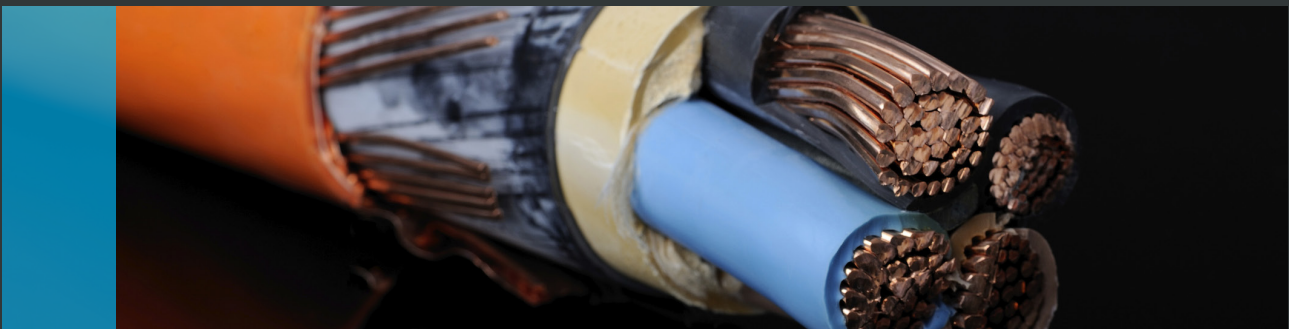


Electrical Services Offered

- Feasibility and Design Services
- Peer Review of Design and Submissions
- Investigations, Studies, Reports
- Value Engineering
- Technical & Specification Writing

How We Can Help

- Offer expertise client may not have
- Relief from time constraints
- Objective outside opinion
- New ideas
- Staffing flexibility



Electrical Design Studies

- Load Flow
- Short Circuit (IEC & ANSI)
- Voltage Drop
- Cable Dimensioning (BS 7671, IEC & IEEE/NFPA)
- Cable Thermal Analysis (IEC 60287 & Neher-McGrath)
- Power Factor Correction
- Low Voltage Calculations (Earthing and Electrical Shock) to BS 7671
- Harmonic Analysis
- Harmonic Filter Design
- Motor Starting and Acceleration
- Transient Analysis
- Power Quality Analysis
- Transformer Inrush Current
- Protection Device Coordination & Discrimination
- 400 Hz System Calculations
- Renewable Sources (Wind and Photovoltaic)
- Hybrid Energy Systems
- Earth [Ground] System Design
- Arc Flash Analysis
- Battery Discharge and Sizing
- System Reliability Studies
- Equipment Dimensioning

Power System Services

myElectrical Engineering offers electrical design, studies, review and expert testimony for power systems.



Power Distribution System Design

Providing both utility and private client design from concept, through detailed design to commissioning and problem-solving.

Some large projects we have been involved with include distribution within large cities and special economic/development zones and the master planning of large infrastructure schemes.



Industrial Power System

Extensive experience of power distribution systems in relation to industrial facilities. These include petrochemical, traction power, large scale mining and material handling operations, airports (both green field and operational) and large water pumping stations.



Power System Studies

Utilising state of the art software (ETAP, EMTP-ATP, MatLab), we can carry out a variety of systems studies to verify the correct operation of electrical, including:

- Load flow, short circuit (IEC & ANSI) and voltage drop
- Cable dimensioning (BS 7671, IEC), thermal analysis (IEC 60287 & Neher-McGrath)
- Power Factor Correction, transformer inrush, harmonic analysis & filter design
- Transient analysis, power quality, motor starting and acceleration
- Protective device coordination & discrimination
- Low voltage (Earthing and Electrical Shock) to BS 7671, 400 Hz systems
- Renewable sources (wind & photovoltaic), hybrid energy systems
- Earth [ground] system design, arc flash analysis, system reliability

Extensive experience managing projects in a wide range of sectors and industries including: Power supply and distribution, Airports, Rail, Industrial and Buildings





We offer technical solutions that minimise capital costs and are fully compliant with relevant laws and regulations.



Renewable Energy

For renewable energy installers, we offer electrical design and engineering support for associated power distribution and grid connections. In particular:

➔ POWER DISTRIBUTION

technical solutions that minimise capital costs:

- Power distribution - technical solutions that minimise capital costs:
- HV and LV cables and interconnections
- Substations
- Energy storage and non-grid connected systems
- Equipment detailing (transformers, inverters, switchgear, etc.)

➔ GRID CONNECTION

regulatory requirements and associated studies:

- G59/3 protection & compliance
- G5/4 harmonic studies
- system operation studies:
 - load flow and fault levels
 - voltage rise
 - transformer inrush
 - protective systems coordination

In carrying out design, we utilise state of the art leading industry recognised software tools including:

ETAP

<http://etap.com>

Amtech

<http://www.amtech.co.uk>


EMTP-ATP

<http://www.emtp.org>

Matlab

<http://uk.mathworks.com>

We have a proven track record of working with clients to ensure cost effective installations, regulation compliance, DNO acceptance and stable and reliable operation.



Technical and consulting services agreements in place with various players in the infrastructure and renewable sectors, including both photovoltaic and hydro-electric.

RECENT CLIENTS & PROJECTS INCLUDE:

Solarcentury, Fatris & Mann Power

Power supply renewal design for Network Rail's Wessex upgrade (GRIP 3 to 5).

Generator upgrade design, Luton Airport.

400 Hz fixed ground power feasibility study, Luton Airport.



EVERYTHING YOU NEED TO ENGINEER & MANAGE YOUR CABLES

#1 WEB BASED TOOL

myCableEngineering.com

Management, scheduling and sizing of LV and MV cables.
In accordance with BS 7671, ERA 69-30, IEC 60502 and others.

Web-based: your cables available on your desktop, tablet and smartphone.

A fully responsive, cloud-based solution that enables users to access cable data and carry out calculations from any device and location.

Competitively priced and subscription based - ensuring users have the latest version at a low ownership cost.

FIND OUT MORE AND START YOUR FREE TRIAL AT:

myCableEngineering.com



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